

## REMARKS

Claims 1 – 3, 5 – 10, and 12 – 15 are currently pending. In view of the following remarks, reconsideration of the application is respectfully requested.

Claims 1 – 3 and 5 – 8 were rejected under 35 U.S.C. 103 as being unpatentable over Prasad (U.S. Patent No. 4,530,664). The Examiner contends that the composition of the claimed alloy overlaps the composition of Prasad '664, and concludes that the properties of each alloy would be expected to be substantially the same. The Examiner further alleges that the Prasad '664 reference states that the coefficient of thermal expansion for the alloy in the reference is about  $13$  to about  $15 \times 10^{-6}/^{\circ}\text{C}$  as claimed. Claims 9, 10, and 12 – 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Prasad '664 in view of Chiaramonte (U.S. Patent No. 4,108,642) for the reasons set forth in paper No. 8, paragraph 6. For the reasons set forth below, these rejections are respectfully traversed.

The claimed invention is now directed to a cobalt-chromium dental alloy comprising by weight percent about 60 to about 85% cobalt, about 15 to about 30% chromium, about 4 to about 20% manganese, and about 1 to about 15% aluminum, indium, gallium, tin, or germanium, or mixture thereof, wherein the coefficient of thermal expansion (CTE) at room temperature to about  $500^{\circ}\text{C}$  is about  $16$  to about  $18 \times 10^{-6}/^{\circ}\text{C}$ . Moreover, the claimed invention is directed to a cobalt-chromium dental alloy comprising by weight percent about 65 to about 80% cobalt, about 18 to about 25% chromium, about 4 to about 10% manganese, about 2 to about 10%, iron, nickel, palladium, or platinum, or mixture thereof, about 1 to about 7% aluminum, indium, gallium, tin, or germanium, or mixture thereof, about 1 to about 5% gold, and about 0.1 to about 3% iridium, ruthenium, rhenium, titanium, silicon, or copper, or mixture thereof, wherein the CTE at room temperature to about  $500^{\circ}\text{C}$  is about  $16$  to about  $18 \times 10^{-6}/^{\circ}\text{C}$ .

The claims now require the manganese content to be from about 4 to about 10% by weight of the composition. The Examiner's attention is directed to Table 2 of the instant application which shows examples of the claimed composition wherein each alloy contain 4% or greater manganese by weight. Turning to Table 3, the Examiner is directed to examine the CTE's set forth in the Table. Each of the nine alloys from Table 2 having a 4% or greater amount of manganese has a coefficient of thermal expansion of

16 x 10<sup>-6</sup>/°C or greater. Prasad '664 does not teach an amount of manganese of 4% or greater and does not teach a CTE at room temperature to about 500 °C of about 16 to about 18 x 10<sup>-6</sup>/°C. The claims are not rendered obvious by Prasad '664.

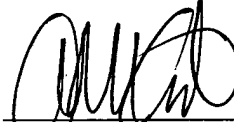
Moreover, Chiaramonte '642 does not cure the deficiencies of Prasad '664. Chiaramonte '642 is unlike the claimed invention and is unlike the alloy in Prasad '664. The small amount of gold added to the instant invention, 1 to 5 wt %, does not change the color of the white alloy to a gold color. Chiaramonte '642 is not concerned with a specific coefficient of thermal expansion. The coefficient of thermal expansion of the alloy of the claimed invention is much greater than that taught by Prasad '664. There is no showing or suggestion in Chiaramonte '642 to add or alter components in the composition therein in order to affect or alter the coefficient of expansion. It would not have been obvious to alter the composition of Prasad '664 in view of the teaching of Chiaramonte '642 to arrive at the thermal expansion claimed in the instant application. The claimed invention is not rendered obvious by the cited references.

In summary, none of the references, alone or in combination, teach applicant's invention directed to a cobalt-chromium dental alloy comprising by weight percent about 60 to about 85% cobalt, about 15 to about 30% chromium, about 4 to about 20% manganese, and about 1 to about 15% aluminum, indium, gallium, tin, or germanium, or mixture thereof, wherein the coefficient of thermal expansion (CTE) at room temperature to about 500 °C is about 16 to about 18 x 10<sup>-6</sup>/°C. Moreover, none of the cited references teach applicant's invention directed to a cobalt-chromium dental alloy comprising by weight percent about 65 to about 80% cobalt, about 18 to about 25% chromium, about 4 to about 10% manganese, about 2 to about 10%, iron, nickel, palladium, or platinum, or mixture thereof, about 1 to about 7% aluminum, indium, gallium, tin, or germanium, or mixture thereof, about 1 to about 5% gold, and about 0.1 to about 3% iridium, ruthenium, rhenium, titanium, silicon, or copper, or mixture thereof, wherein the CTE at room temperature to about 500 °C is about 16 to about 18 x 10<sup>-6</sup>/°C. None of the references show or suggest applicant's claimed invention and notice to this effect is respectfully requested.

Accordingly, it is believed that claims 1 - 3, 5 - 10, and 12 - 15 specify patentable subject matter and are now in condition for allowance. Applicant therefore respectfully

requests favorable reconsideration and allowance of this application. The Examiner is requested to telephone Applicant's attorney at the number listed below if it will advance the prosecution of this case. If necessary, the Examiner is authorized to charge further fees necessary to advance the prosecution in this case from Deposit Account No. 500718.

Respectfully submitted,



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